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08/26/2009

EXAMINER

TUROCZY, DAVID P

ART UNIT

PAPER NUMBER

1792

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/566,194		RAS ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	DAVID TUROCY		1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 5-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendments, filed 6/3/2009, have been fully considered and reviewed by the examiner. The examiner notes the amendments to claims 1 to include the subject matter of claims 3 and 4 and deletion of claims 3 and 4. Claims 1-2 and 5-19 are pending in the instant application.

### ***Response to Arguments***

2. Applicant's arguments with respect to the rejection(s) of claim(s) 3 and 4 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US Patent 1897214.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 7, 14, 15, 19 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 2356938 by Lombard, hereafter Lombard.

Lombard discloses a method for forming a coated grinding wheel, including mixing a diamond abrasive with boron powder and boric acid at a coating

temperature of 950°C in a nitrogen (i.e. inert) atmosphere for a time sufficient to coat the diamond (see entire reference).

Claim 2: A grinding wheel is an abrasive tool.

Claim 7, and 19: These claims are rejected for the reasons set forth above.

Claim 14-15: Lombard discloses 4.5 hours of heating (page 3, Left column, lines 65-66).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-6, 8-9, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 2356938 by Lombard, hereafter Lombard.

Claim 5-6: The reference fails to disclose the appropriate composition, however, it is the examiners position that the composition of the source material is a result effective variable: directly affecting the quality of the film deposition and the resulting deposited film. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate amount of each source, since it has been held that discovering an optimum value of a result

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effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 8-9: Lombard fails to disclose the temperature as claimed, however the selection of the appropriate temperature for the coating process is well within the skill of one of ordinary skill in the art at the time of the invention to lead to predictable results. Additionally, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate temperature, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 105 USPQ 223 (CCPA 1955).

Claims 8, 9 and 16: The coating time and temperature are a known result effective variable, directly effecting the coating characteristics and therefore it would have been obvious to one skill in the art at the time of the invention was made to determine the optimal value for the time and temperature used in the process of, through routine experimentation, to deposit the desired boron film with the desired properties associated with the boron coating process.

Claims 17-18: Lombard does not discloses the range of boron source to abrasive, however, the ratio of coating material to the substrate is a result effective variable. If the ratio is too low, the substrate is insufficiently or improper coated and too high results in thicker or improper coating. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have determined the appropriate amount of boron source, relative to the amount of substrate, through

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routine experimentation to effectively and efficiently coat the substrate with the desired amount of coating.

7. Claims 1, 2, 5-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over ZA 20017995, hereafter ZA '995 in view of Chemical Vapor deposition of boron and boron nitride from decaborane by Kim et al., hereafter Kim.

Claim 1: ZA '995 discloses a process for producing a boron coated abrasive, the process including the steps of contacting the abrasive to be coated with a boron source, at a coating temperature of about 800.degree. C. to about 1200.degree. C. in an inert atmosphere, for a time sufficient to coat at least a portion of the abrasive (for examples abstract, Page 5-6). ZA'995 discloses boron powder (page 5) ZA '995 discloses coating the abrasive with a boron carbide coating, but fails to disclose the boron powder/boric acid composition. However, Kim discloses known and suitable boron sources for deposition of boron coatings include elemental boron and boric acid (see page 2796) and therefore it would have been obvious to have modified ZA '995 to include boric acid with the disclosed boron powder will provide predictable results of providing a boron source for the deposition of a boron film.

Claim 2: ZA '995 discloses the abrasive is in the form of abrasive particles, larger abrasive bodies, or abrasive tools (page 5).

Claims 5-6: The combination of references fails to disclose the appropriate composition, however, it is the examiners position that the composition of the source

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material is a result effective variable: directly affecting the quality of the film deposition and the resulting deposited film. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate amount of each source, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 7-8: These claims are taught by ZA '995 at page 6, see 1000°C as the process temperature, which the examiner maintains is about 1100°C as required by claims 8.

Claims 7-16: The examiner maintains the position as discussed above with regards to the temperature, additionally, ZA '995 discloses the preheating steps, the heating rates, and the final temperature are all result effective variable that directly effect the coating process (page 6) and therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process as taught by ZA '995 to optimize the result effective variables, in this case the particular heating steps and rates, using routine experimentation to reap the benefits of the proper film deposition.

Specifically to Claim 10-14: Specifically, ZA '995 discloses preheating to a temperature of 300°C at a rate of 10°C/min, but fails to disclose maintaining at the temperature for 15 to 45 minutes, however, the reference discloses heating slowly thereafter at 10°C/hr and it is the examiners position that it would have been obvious to maintain the temperature for a time period within the range as claimed with a

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reasonable expectation of predictable results. Additionally, the examiner maintains the claims include about language and the examiner maintains 300-310°C over an hour period is "about" 300°C, within the range as claimed.

Specifically to Claims 14-16: ZA '995 discloses the final temperature at a time sufficient to deposit the film, discloses a about 4 hours, however, discloses the time is a result effective variable and optimizing the time through routine experimentation would have been obvious to one of ordinary skill in the art to deposit an appropriate film.

Claim 14: ZA '995 discloses the abrasive and boron source are heated at the coating temperature for at least 30 minutes (Page 6).

Claim 15: ZA '995 discloses the abrasive and boron source are heated at the coating temperature for at least 3 hours (page 6).

Claims 17-18: ZA '995 does not discloses the range of boron source to abrasive, however, the ratio of coating material to the substrate is a result effective variable. If the ratio is too low, the substrate is insufficiently or improper coated and too high results in thicker or improper coating. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have determined the appropriate amount of boron source, relative to the amount of substrate, through routine experimentation to effectively and efficiently coat the substrate with the desired amount of coating.

Claim 19: ZA '995 discloses the abrasive is diamond or cubic boron nitride (page 4).



8. Claims 1-2, 5-9, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Celikkaya in view of US Patent 1897214 by Ridgway and Kim.

Claim 1: Celikkaya discloses a process for producing a boron coated abrasive, the process including the steps of contacting the abrasive to be coated with a boron source, at a coating temperature of about 800.degree. C. to about 1200.degree. C. in an inert atmosphere, for a time sufficient to coat at least a portion of the abrasive (for examples Column 12-14). Celikkaya discloses boron powder (column 12, lines 35-45) and Celikkaya discloses using any boron source for forming the boron coating and a boron carbide coating ( (see column 12), however, the reference fails to disclose boric acid in combination with boron powder. However, Ridgway discloses known and suitable boron precursors include boric acid and boron oxide for forming a boron coating on an abrasive substrate (see entire reference) and Kim discloses elemental boron and boric acid are known vapor precursors (2796). Therefore, taking the references collectively it would have been obvious to one of ordinary skill in the art to have modified Celikkaya to include boric acid with the boron powder with a reasonable expectation of successful results of providing a boron coating because Ridgway and Kim discloses boric acid is a known vapor source for boron comprising films and thus one would expect success in combining boron power and boric acid.

Claim 2: Celikkaya discloses the abrasive is in the form of abrasive particles, larger abrasive bodies, or abrasive tools (examples).

Claims 5-6: The combination of references fails to disclose the appropriate composition, however, it is the examiners position that the composition of the source material is a result effective variable: directly affecting the quality of the film deposition and the resulting deposited film. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate amount of each source, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 7-9: These claims are taught by Celikkaya at column 13, lines 35-40, as the process temperature, which the examiner maintains is about 1150°C as required by claims 9.

Claims 14-16: Celikkaya discloses about 6 hours, which the examiner maintains reads on atleast 6 hours. The term “about” render the prior art inclusive of certain degree of times longer then 6 hours (Column 13, lines 25-35).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6524357 discloses the deposition temperature and ramp rate are known to require strict control due to the substrate (Column 7, 10).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID TUROCY whose telephone number is (571)272-

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2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David Turocy/  
Examiner, Art Unit 1792